Potential CH4 Emission through the snowpack along the Haul Road

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Abstract

There are a few studies on winter CH4 flux-measurement in tundra and boreal forest ecosystem, Alaska, because the terrestrial ecosystem has two roles of CH4 emission and oxidation with time. Then, we have observed CH4 flux-measurements in 4 tundra, 4 boreal forest sites and 1 ecotone between tundra and boreal forest along the trans-Alaska pipeline during the winter seasons of 2006 to 2010. In seasonally snow-covered boreal forest sites, the response of CH4 emission depends on snow depth and air temperature during January and February; on the other hand, there are no relationships between CH4 emission and snow depth/air temperature. It suggests that CH4 produced in subsoil below the frozen soil surface moves through the cotton grass in top of tussock to snowpack (Kim et al., 2007). It thought to be due to the deep frozen soil column, the pressure difference between air and soil, and the oxygen constraint in the soil. However, in tundra ecosystem, there is not relationship between winter CH4 emission and snow depth/air temperature. It may be other mechanism of CH4 production in the ecosystem.

Cotton Grass (Eriophorum)